DOCUMENT RESUME

ED 187 012 EA 012 687

AUTHOR Verwey, C. T.
TITLE The Use of Statistics on Repeaters for Educational and Manpower Planning. Lecture-Discussion Paper No. 8.
INSTITUTION University of the Orange Free State, Bloemfontein (South Africa).
PUB DATE Nov 78
NOTE 23p.; Not available in paper copy due to small print of original document.

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Academic Failure; Cohort Analysis; Cost Estimates; Dropout Rate; *Dropouts; *Educational Planning; Elementary Secondary Education; Foreign Countries; *Grade Repetition; Human Capital; *Labor Supply; Matrices; School Holding Power; *Statistical Data; Student Attrition
IDENTIFIERS South Africa

ABSTRACT

Educational planners are concerned with the inflow of pupils in order to plan for adequate facilities and sufficient teachers. Statistics on repeaters, however, enable the determination of the flow of pupils through and from the educational system. Since repeaters cost educational systems double in the form of expenses for teachers and equipment, statistics on repeaters can be used in the educational planning process. Reasons for the incidence of repeaters may be traced by means of an analysis of the statistical data. Repeater statistics also make a valuable contribution by increasing the accuracy of the determination of the supply of manpower according to educational level. A technique for representing pupil flow and an extension of the technique in order to determine the supply of manpower are both demonstrated. (Author/MLF)

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LECTURE-DISCUSSION PAPER NO 8

THE USE OF STATISTICS ON REPEATERS FOR EDUCATIONAL AND MANPOWER PLANNING

C T VERWEY

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C.T. VERWEY

BLOEMFONTEIN

NOVEMBER 1978

FOREWORD

Frequently researchers of the Research Unit for Education system planning have lecture-discussions with educational planners of various education departments on topics in the field of educational planning.

This lecture-discussion series is an attempt to record the principal ideas expressed by the researchers during these discussions. It is an informal publication not subjected to the normal type of editing and must therefore not be seen as an official publication.

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THE USE OF STATISTICS ON REPEATERS FOR EDUCATIONAL AND MANPOWER PLANNING

1. INTRODUCTION

Correct and adequate statistics are of primary importance to the Department of Education. The collection of these statistics is one of the main tasks of the planning section, as statistical data is essential to future-directed planning.

In the past educational statistics were primarily employed for administrative purposes in a purely mathematical capacity (compare Goldstone, 1965, p.1). With the contemporary emphasis on the planning task of the educational planner, a new approach has become necessary. A new approach, however, requires the development of new techniques, and new techniques again require distinctively new statistical data. This may include information which, in the past, has never been considered of sufficient importance to justify the collection thereof.

One of the main shortcomings of the currently available statistical data is the fact that it is only capable of an annual, quantitative reflection of the contemporary situation. The primary objective of the statistics was indeed only to end off the year with a neatly printed annual report.

The educational planner, however, wishes to use the statistics as planning material. He is also interested in the flow of pupils through the system. The amount of data available in most countries cannot fulfil this function, with the result that additional information will have to be collected.

The collection of information on repeaters may to a large extent fulfil this need. It may serve as a first step to draw up a matrix of pupils by means of which the throughflow of pupils through the system may be determined. With greater accuracy the outflow of pupils from the

educational system to the economy may also be determined by the same means.

With this flow technique the educational planner may make a valuable contribution, as the data may serve as a point of contact between the educational system and the economy. For manpower planning it is necessary that it should be possible to determine the inflow of manpower of different educational levels from the educational system to the economy. This will indeed be made possible by means of the statistical data which the educational planner may supply.

2. WASTAGE WITHIN THE EDUCATIONAL SYSTEM

2.1. The educational system as a producing unit

The term wastage has a strong economic connotation. Economists more or less regard the educational system of a country in the same way as a manufacturing industry aimed at producing goods. More specifically, capital goods destined to serve in a further producing process, are produced here. In contrast with this consumer goods are destined for final use. The capital goods delivered by the educational system may therefore rightly be regarded as human resource development or human capital (Harbison, 1973, p.12; Joubert, 1976, p.34).

In order to produce goods, money is needed. In order to produce human capital, funds are also necessary. The funds allocated to education must be delivered by the economy. In developing countries educational expenditure claims a large percentage of the national budget.

If these funds are not employed profitably or if the results of the expenditure show deficient elements, wastage of funds has occurred. The deficient elements

resulting from the producing process, promote waste of money in two ways. Some of these products have to repeat the production process, which results in the same amount of money having to be spent on the same product twice or even for a third time. Some of these products are completely unable of completing the production process and have to leave the stream of production completely. The funds spent on such a product have then been wasted as the product does not command sufficient development to serve as capital goods independently.

If a pupil fails and has to repeat the standard the next year, or even leaves the school, wastage has occurred. The money spent on these pupils by way of classroom-space, equipment and teachers, may amount to several thousand rand (Freire, 1977, p.2).

2.2. The cost of repeaters

There are several ways of assessing the real wastage. If a survey of repeaters is made, the cost of this part of the wastage may be calculated directly. The wastage caused by dropouts is more difficult to determine as the dropout figure is not always available.

An example of how this calculation is done, is reflected in figure 1. The 1978 statistics of Qwaqwa are used as an example.

FIGURE 1: The cost of repeaters in Qwaqwa, 1978*

Total current educational expenditure	R	3 889 000,00
Total pupil enrolment		54 117
Cost per pupil	R	71,86
Repeaters		5 843
Cost of repeaters	R	419 894,00
Cost of repeaters as a percentage of the total current expenditure		10,8%

The total wastage will be much higher if the cost of the dropouts could also be added

*The figures were supplied by the Department of Education of Qwaqwa

2.3. The importance of the collection of statistics on repeaters

The question often arises why such emphasis is put on the incidence of repeaters nowadays. In the past no surveys were made in the schools in order to track down repeaters. The departments of education of developed communities find the incidence of repeaters so trifling as to justify no surveys.

It is indeed true that repeaters do not often occur in developed communities. For the white child there is a stigma attached to the fact that he has to repeat a standard. The Department of Education of the Orange Free State makes a practice of transferring certain repeaters in the lower standards to auxiliary classes. Therefore they do not find it necessary to collect statistics on repeaters*.

In the case of developing communities the situation is completely different. As a result of several factors such as poorly qualified teachers, illiterate parents and insufficient facilities, the incidence of repeaters is much higher here. The repeaters, as a percentage of enrolment, sometimes run to 20 per cent. In section 4 some figures on repeaters, collected by R.U.E.P. for a few of the homelands, are supplied.

The excessive incidence of repeaters suggests to the educational planner that there are inefficiencies within the system. If he has sufficient detailed repeater statistics at his disposal, the inefficiencies may be tracked down and certain remedial steps can then be taken.

Repeaters and dropouts cost a department of education a lot of money. The money spent on repeaters may be calculated directly if the figures on repeaters are available. The

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*Disclosed during a telephone conversation with Mr. Leich on 21 September 1978

dropout figure is not directly available although it may be assessed with the help of the figures on repeaters.

Statistics on repeaters are essential to the compilation of a cohort diagram which reflects the flow of pupils. In section 5 it will be shown how repeater statistics may be used for the compilation of an educational matrix which is used in manpower planning.

3. A TECHNIQUE FOR REPRESENTING PUPIL FLOW

3.1. A few terms

Difficulties sometimes arise because certain terms are not used in the correct connotation. Each has a distinctive meaning and fits a specific part of the educational matrix.

The word cohort denotes a certain group of pupils who started their school career, generally in SSA, during a specific year. The cohort-diagram diagrammatically represents the flow of this group through the different standards.

The word matrix refers to the complete educational matrix by means of which the enrolment for the different standards during successive years is represented. As opposed to the cohort, we shall here find interinfluence amongst the different groups.

Several things may happen to a group of pupils at the end of a year.

1. Some of them may pass and continue with the next standard during the following year. This represents the normal flow

2. Others may fail and are referred to as failures

3. Some of these failures may repeat the standard the next

year and are then known as repeaters

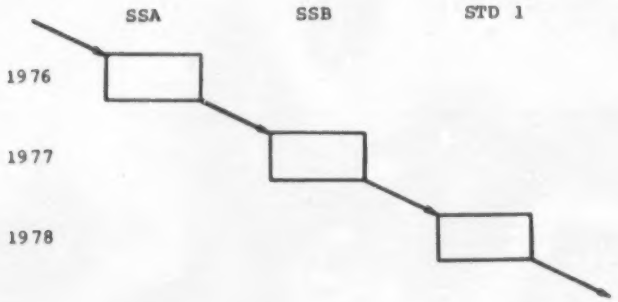
4. Some of the failures may leave the school system to find employment and are then referred to as dropouts

5. It may sometimes happen that a pupil, especially in the higher standards, passes the examination and thereafter leaves the school in search of employment. As far as the educational system is concerned these pupils are also dropouts, but as far as manpower is concerned there is a difference as these people do have the educational level of that standard

   The term returners is used for pupils who have been classified as dropouts during previous years and who now return to the system. These persons may include pupils who want to resume their studies and who have not necessarily failed. The returners who have previously failed will generally be included in the figures on repeaters.

Some of these pupil flows may be illustrated by means of the cohort-diagram.

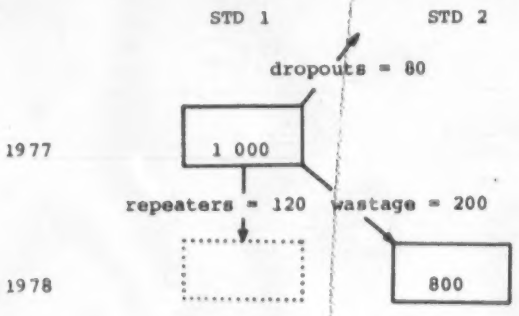
FIGURE 2: THE NORMAL INFLOW AND THROUGHFLOW OF PUPILS IN A COHORT-DIAGRAM



The largest pupil flow within the system is the normal inflow and flow of pupils through the system. An inflow of pupils occurs in SSA and as these pupils succeed, they pass to the next standard during the following year.

This flow, however, only occurs in ideal situations. In developing countries we seldom find it because educational wastage occurs along the way and reduces the normal through-flow. Deviations from the normal flow are caused by pupils failing and repeating standards while others leave the school to find employment (Jolly, 1966, p.49).

FIGURE 3: REPEATERS AND DROPOUTS IN A COHORT-DIAGRAM

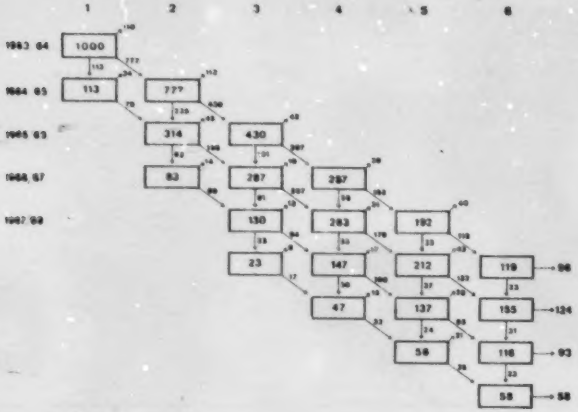


As the group of pupils progresses from standard to standard through the years, the original number of pupils decreases. This decrease in the original group of pupils is called wastage. In figure 3 the wastage is 1 000 - 800 = 200.

This wastage occurred in two different ways. Firstly, a group of pupils repeated the standard. The repeaters may be traced by means of a survey of the Std 1 pupils during 1978. They numbered 120 pupils. Secondly, a group of pupils dropped out and left the system, possibly in search of employment. The dropouts in figure 3 numbered 80.

If the flow of a certain group of pupils can be followed closely throughout the educational system, a complete cohort-diagram may be drawn up. In figure 4 the flow of 1 000 pupils in Algeria was followed and represented.

FIGURE 4: A COHORT-DIAGRAM OF 1 000 PUPILS IN ALGERIA



Source: Brimer and Pauli, 1971, p.4"

It should be noted that the enrolment for each year cannot be used here in order to draw up this diagram. The flow of a specific group or cohort is observed regardless of the inflow from other areas or of repeaters from previous groups. Pupil enrolment tables also include the figures of groups from previous years.

3.3. The necessity of repeater statistics for the technique

The educational planner generally only has the statistical data which pupils may offer within the system, at his disposal. This data is collected annually from the different

schools by the planning section. The data concerning dropouts cannot be determined directly, as these pupils have left the system.

The wastage may be determined by means of a cohort-diagram as indicated in figure 3. If the number of repeaters can be determined by means of a survey, the number of dropouts may be determined by means of a simple calculation.

as wastage = repeaters + dropouts
dropouts = wastage - repeaters

This is the only way in which the dropouts may be calculated from the figures. It is necessary to know what the number of dropouts is,because these people flow into the economy. For the purposes of manpower planning the determination of the educational levels of these schoolleavers is a prerequisite.

4. AN EXTENSION OF THE TECHNIQUE IN ORDER TO DETERMINE THE SUPPLY OF MANPOWER

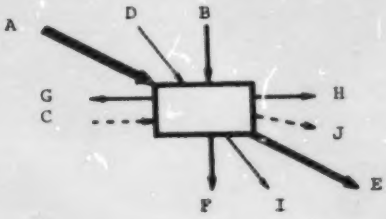
4.1. The flow of pupils to and from one element in the educational matrix

The difference between the educational matrix and the cohort-diagram is that the educational matrix endeavours to represent the annual pupil enrolment and therefore cannot represent an isolated group of pupils as in the cohort-diagram. The repeaters of the previous years for instance, flow into the current standards together with the normal inflow of pupils.

The flow of the isolated group as represented by the cohort-diagram according to figure 3 was made up of the normal inflow and outflow, the repeater outflow and the dropout outflow. Within the educational matrix far more flows occur

and are represented in figure 5.

FIGURE 5: THE POSSIBLE FLOW OF PUPILS TO AND FROM ONE ELEMENT WITHIN AN EDUCATIONAL MATRIX



The differences in the pupil enrolment figures for the different years may therefore be attributed to ten possibilities.

The pupil enrolment in a specific standard is determined by the main inflow A from the preceding standard, the previous year. The pupil enrolment also includes pupils from the previous year who failed, i.e. repeaters (B). A small number of returners (C) may also flow into the standard. These are people who return to the educational system after a period of absence. The children of immigrants (D), may also cause an inflow.

The outflow from a standard may include six possibilities: The normal outflow (E) to the next standard. The pupils who failed the standard and have to repeat it the following year, namely F. Pupils who failed and leave the educational system, namely the dropouts (G). Pupils may also pass the standard and then leave the school, namely H. As far as the educational system is concerned, this group is dropouts also. An outflow may also be caused by emigrants who remove their children from the educational system, namely I. A decrease in the pupil enrolment owing to pupil mortality is represented by J in figure 5.

4.2. The assimilation of an educational matrix for manpower objectives

The manpower planner is specifically interested in the outflow of pupils from the educational system. Certain of these pupils flow into the economy in search of employment. Although they cannot always all be provided with employment, they serve as potential workers and thus form the supply of manpower from the educational system. In order to determine the full supply of manpower, it is also desirable that the educational level of the schoolleavers should be determined.

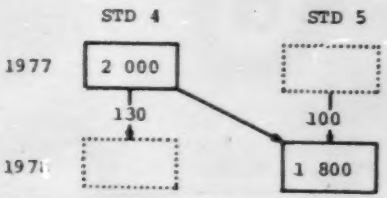
Amongst the six forms of outflow illustrated in figure 5, only the flows G and H are of importance to the manpower planner. The flows E and F remain within the educational system and are therefore of no importance to manpower planning. For all practical purposes it is accepted that the immigration flow D will be cancelled by the emigration flow I. Although pupil mortality does occur, it forms a relatively small flow which may be left out of account for manpower planning.

The flows G and H, i.e. those which leave the educational system have to be taken into account.

In the closed cohort-diagram it has been shown that

dropouts = wastage - repeaters

FIGURE 6: DETERMINATION OF DROPOUTS WITHIN AN EDUCATIONAL MATRIX



The repeaters are traced by means of a survey whereas the wastage may be determined by means of the educational matrix.

Suppose that 2 000 and 1 800 are the figures appearing in the educational matrix, i.e. the annual pupil enrolment for each standard. The normal flow from Std 4 (1977) to Std 5 (1978) will therefore be 1 800 - 100 = 1 700 pupils. As wastage is the difference between the normal potential flow and the normal real flow, the wastage = 2 000 - 1 700 = 300 pupils.

If the repeaters of Std 1 are 130, and the wastage 300, the schoolleavers = 300 - 130
= 170 pupils.

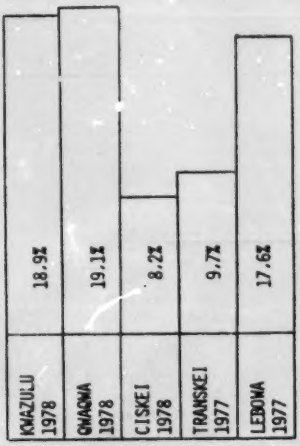
The educational level of the entire population may only be determined by means of a comprehensive census. The collection and publication of census-statistics during the 1970 survey was so extensive that detailed figures were only published towards the end of 1976. If the output from the educational system can be determined throughout, the census-statistics may serve as basis. With the marginal annual contribution of the educational system to the quantitative and qualitative manpower supply, the total supply of manpower according to educational level may be determined.

5. THE GENERAL USE OF REPEATER STATISTICS BY THE EDUCATIONAL PLANNER

Apart from the possible uses for the drawing up of flow-diagrammes, the statistics on repeaters may be of service to the educational planner in the identification of problem areas.

In most of the Homelands for instance, there exists a system of automatic promotion in the substandards. This would mean that there ought not to be any failures or repeaters in Substandard A.

FIGURE 7: THE PERCENTAGE OF REPEATERS IN SSA IN DIFFERENT COUNTRIES



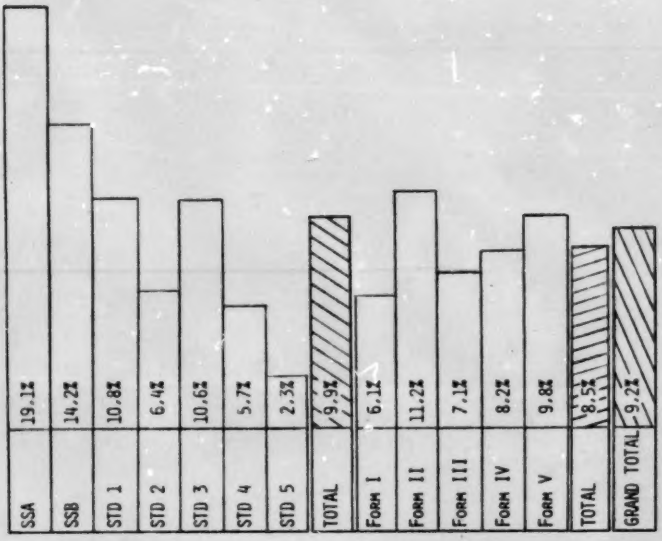
Source: Unpublished statistics assimilated by R.U.E.P.

Figure 7 shows that the incidence of repeaters in these standards is growing to serious proportions. It would therefore seem that though pupils are enrolled at schools they do not, for various reasons, accumulate the required number of days of school attendance which would help them to qualify for automatic promotion.

The assimilation of the repeater figure in a percentage for each standard may also be of use to the educational planner. The repeater survey conducted by R.U.E.P. in Qwaqwa during 1978, shows an interesting tendency.

In the primary standards the repeater percentage was highest for the substandards. A sustained decrease in the percentages for each successive standard occurred with standard 3 as the only exception.

FIGURE 8: THE PERCENTAGE REPEATERS IN EACH STANDARD. QWAQWA, 1978

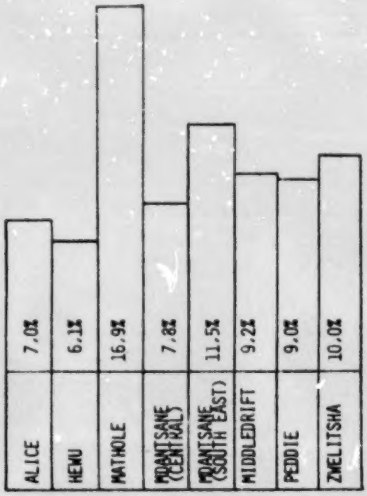


Source: Unpublished statistics assimilated by R.U.E.P.

In the secondary standards the percentages again started to increase systematically up to form V. Form II was also an exception here.

If the educational planner wishes to isolate the problem of repeaters, the percentage repeaters for each inspectoral circuit may be represented. Several factors within the inspectoral circuit may be the cause of the high repeater percentage. Each inspectoral circuit may have distinctive problems which may result in the repeater percentage varying widely from circuit to circuit.

FIGURE 9: PERCENTAGE REPEATERS IN DIFFERENT INSPECTORAL CIRCUITS, CISKEI, 1978 (PRIMARY SCHOOLS)



Source: Unpublished statistics assimilated by R.U.E.P.

An example of a questionnaire used by R.U.E.P. in order to obtain repeater statistics is included in the appendix. It includes the repeater figures as well as the pupil enrolment for a specific year. The survey must be conducted in each school for each separate standard. For manpower planning objectives it is desirable that there should be distinguished between boys and girls. An optional question to the principal is also included in answer to which he may give the reasons which are, according to his impression, responsible for the incidence of repeaters. A possible solution to the problem may also be proposed by him on the questionnaire.

6. CONCLUSION

The educational planner is always concerned with the inflow of pupils as he has to make provision for adequate facilities and sufficient teachers in his schools. The statistics on repeaters, however, also enable him to determine the flow of pupils through and from the system.

By collecting the repeater statistics the educational planner makes a valuable contribution to manpower planning as these new statistical data enable the manpower planner to determine the supply of manpower according to educational level with greater accuracy.

Statistics on repeaters may also be used to good purpose in the educational planning process. Repeaters cost a department of education a large amount of money as the same amount of money in the form of teachers and equipment has to be spent on the same pupils twice or even for a third time. Reasons for the incidence of repeaters may be traced by means of an analysis of the statistical data.

The reasons supplied by each principal on the questionnaire concerning the incidence of repeaters may be used profitably by the educational planner. A single such example is the complaint that pupils are employed by parents to look after the younger children with inevitable weak attendance, or that children are sent to school at too early an age because the parents work. It may indicate to the educational planner for instance, the necessity for crèches where young children may be cared for.

The technique by means of which the flow within an educational matrix is determined, serves its purpose to a large extent. In practice, however, problems are encountered, especially in the homelands where the immigration and emigration flow is not the same, with the result that the D and I flows in figure 5 show a residual. This will demand the collection of additional data. If a closed group, as for instance the total blacks or the Zulu, Tswana or Xhosa is studied, this problem is eliminated.

FORM WITH RESPECT TO REPEATERS. CISKEI/1978

Circuit: MOUNTSIMME CENTRAL

School: FANTI CABA H.P

Address: P/BAG X1208 MOUNTSIMME 5319

Number of teachers: 13

Classes	Enrolment **				Repeaters *		
	Boys	Girls	Total		Boys	Girls	Total
Sub A							
Sub B							
Std 1							
Std 2							
Std 3	115	74	189		11	8	19
Std 4	74	41	115		3	2	5
	189	115	304		14	10	24
Std 5	94	62	156		2	3	5
Std 6 (Form I)							
Std 7 (Form II)							
	94	62	156		2	3	5
Std 8 (Form III)							
Std 9 (Form IV)							
Std 10 (Form V)							

PRINCIPAL — 1978-05-30 DATE

CIRCUIT INSPECTOR — DATE

(DEPARTMENT OF EDUCATION AND CULTURE SECRETARY'S OFFICE SECRETARY FOR EDUCATION 21-05-1978 Private Bag X5011 ZWELITSHA)

* Repeaters are students who failed their present standard and who, at the moment, are repeating the standard

** The enrolment of 1978 including the repeaters

OPTIONAL

What do you consider the main reasons for the presence of repeaters?

1. Lack of control of homes. Pupils are left to do what they like. They are not checked whether they do attend school or not. As a result some play truant.
2. Lack of communication. Parents do not pay visits to the school. They do not even attend parents meetings. When they written letters by teachers they don't respond.
3. Pupils are independent. Some parents leave their homes for a long time and pupils become independent. This make them to be too mischievous in many ways i.e. playing where they like and doing what they like.

Can you make any suggestions to solve the problem?

1. Maintainance of Communication. It must be made a matter of must that no pupils should admitted unless he/she is brought by the parent/guardians. No parent should ever fail to attend a parents meeting unless a terrible reason is given to convince.
2. Educating Parents. Parents need to be educated about school approved procedure and the department's Regulations and Policy. This may be facilitated by supplying the parents with copies of the department's policy concerning the rights and duties of pupil at school and the parent's responsible duty.

1978-05-30

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